

Claims

1. An adjustable pedal assembly for a motor vehicle adapted to be mounted on a body structure of the vehicle and operative to generate a control signal for controlling an associated device of the motor vehicle, said assembly comprising:

a carrier;

guide means mounting the carrier for fore and aft movement relative to the vehicle body structure;

10 drive means for moving the carrier along the guide means;

a pedal structure mounted on the carrier for movement relative to the carrier and including a pedal pad;

15 generator means operative in response to movement of the pedal structure relative to the carrier to generate an electric control signal proportioned to the extent of movement of the pedal relative to the carrier;

a coil spring arranged to be torsionally tightened in response to a force applied to the pedal pad 20 whereby to provide a spring resistance force opposing the pedal apply force and arranged to be torsionally relaxed in response to release of the pedal apply force whereby to provide a spring return force; and

25 means operative in response to torsional tightening of the spring to generate a frictional resistance force that is additive with respect to the spring resistance force and subtractive with respect to the spring return force.

2. An adjustable pedal assembly according to  
claim 1 wherein:

the operative means includes an annular sleeve  
mounted on an annular friction surface; and

5 the coil spring closely encircles the sleeve so  
that the torsional tightening of the spring urges the  
sleeve into frictional engagement with the friction  
surface.

3. An adjustable pedal assembly according to  
10 claim 2 wherein:

the pedal structure includes a pedal arm carrying  
the pedal pad at the lower end of the pedal arm and a pivot  
shaft at the upper end of the pedal arm mounting the pedal  
arm for pivotal movement on the carrier;

15 the carrier includes a housing defining a hub  
structure defining the annular friction surface;

the pivot shaft is journaled in the housing and  
is positioned concentrically within the hub structure;

the sleeve is positioned over the hub structure;  
20 and

the coil spring winds around the sleeve with one  
end of the spring anchored to the pedal arm and the other  
end of the spring anchored to the housing.

4. An adjustable pedal assembly according to  
25 claim 3 wherein the generator means comprises a  
potentiometer whose setting is varied in response to  
pivotal movement of the pedal structure.

5. An adjustable pedal assembly according to  
claim 4 wherein the setting of the potentiometer is varied  
in response to rotary movement of the pivot shaft.

6. An adjustable pedal assembly according to  
5 claim 5 wherein:

the pivot shaft includes a first end portion at  
one side of the pedal arm and a second end portion at  
another side of the pedal arm;

10 the first end portion of the pivot shaft is  
positioned within the housing hub structure; and

the second end portion of the pivot shaft  
comprises an input shaft for the potentiometer.

7. An adjustable pedal assembly according to  
claim 1 wherein:

15 the guide means comprises a guide rod;

the carrier includes an upper portion mounted on  
the guide rod for sliding fore and aft movement along the  
guide rod; and

20 the pedal structure includes a pedal arm having  
an upper end mounted on a lower portion of the carrier.

8. An adjustable pedal assembly according to  
claim 7 wherein:

the pedal arm is pivotally mounted on the lower  
carrier portion; and

25 the generator means includes a potentiometer  
mounted on the lower portion of the carrier and means

operative in response to pivotal movement of the pedal arm to vary the setting of the potentiometer.

9. An adjustable pedal assembly according to claim 8 wherein:

5 the guide rod comprises a hollow rod;

the carrier further includes a nut slidably positioned within the hollow of the guide rod and means connecting the nut to the carrier so that sliding movement of the nut within the guide rod moves the carrier fore and

10 aft along the guide rod; and

the drive means includes a screw shaft threadably received in the nut and means operative to rotate the screw shaft.

15 9 10. An adjustable pedal assembly according to claim 9 wherein:

the lower portion of the carrier defines a hollow; and

the potentiometer is positioned in the carrier hollow.

20 11. An adjustable pedal assembly according to claim 10 wherein the potentiometer includes a central shaft comprising a pivot shaft of the pedal arm.

12. An adjustable pedal assembly according to claim 11 wherein the upper end of the pedal arm is

positioned in the carrier hollow in side by side relation to the potentiometer.

13. An accelerator pedal assembly for a motor vehicle adapted to be mounted on a body structure of the  
5 vehicle and operative to generate a control signal for controlling a throttle device of the motor vehicle, said assembly comprising:

a hollow guide rod;

a nut slidably positioned in the guide rod;

10 a carrier slidably mounted on the guide rod;

means drivingly connecting the nut to the carrier so that sliding movement of the nut within the guide rod moves the carrier slidably along the guide rod;

a screw shaft within the guide rod threadably  
15 engaging the nut;

a pedal structure including a pivot shaft mounted on the carrier, a pedal arm extending downwardly from the pivot shaft, and a pedal pad on the lower end of the pedal arm;

20 a potentiometer mounted on the carrier and operative in response to pivotal movement of the pivot shaft to generate an electric control signal proportioned to the extent of movement of the pedal arm relative to the carrier;

25 a coil spring positioned around the pivot shaft and having one end anchored to the pedal arm and another end anchored to the carrier, the spring being arranged to be torsionally tightened in response to a force applied to

the pedal pad whereby to provide a spring resistance force opposing the pedal apply force and arranged to be torsionally relaxed in response to release of the pedal apply force whereby to provide a spring return force; and

5 means operative in response to torsional tightening of the spring to generate a frictional resistance force that is ~~an~~ additive with respect to the spring resistance force and subtractive with respect to the spring return force.

10 14. An accelerator pedal assembly according to  
claim 13 wherein:

the operative means includes an annular sleeve mounted on an annular friction surface; and

15 the coil spring closely encircles the sleeve so that the torsional tightening of the spring urges the sleeve into frictional engagement with the annular friction surface.

15. An accelerator pedal assembly according to  
claim 14 wherein:

20 the carrier includes a housing; and the housing includes a hub structure in surrounding relation to the pivot shaft and defining the annular friction surface.

*add a2*